# CASE OF MECHANICAL INJURY OF THE KIDNEYS, FOLLOWED BY COMA, &c.

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In consequence of death generally so speedily following the suspension of the excretion of urea by the kidneys, from its consequent quick absorption into the blood, and poisonous influence on the brain and nervous system, it rarely happens that time is given for a practitioner to determine decidedly, both chemically and pathologically, that the comatose symptoms depend altogether on the non-elimination of urea by the kidneys. The following case, from the attending circumstances, elucidates this point so simply and fully, that I cannot refrain putting it on record.

On the 23d of last September, Master Edward Chimes, aged eight years, in perfect health, while at play, was run over across the loins by a heavy truck. In two hours after the accident I saw him. He was then in a state of collapse; and my impression was, that some internal hemorrhage was then going on, for he was blanched, cold, and pulseless. He complained of acute pain in the left lumbar region, which was very tender to the touch, spreading to both inguinal and the pubic region. I gave him stimulants, and kept him warm; by which means, in the course of thirty-six hours, he gradually improved, *and then he passed a large quantity of blood with his urine*, not having passed any urine since the accident. This was repeated several times during the next twenty-four hours.

I examined this urine and blood most carefully; but *failed* to *detect* the least particle of *urea* or *urates* in it.

My little patient became more restless; fever set in, with a pulse at 130; and the pain in the region of the kidneys increased, notwithstanding the application of leeches, &c. &c. But these symptoms, in the course of two days, were succeeded by coma. He could not be kept awake.

I now bled him in the arm, and re-applied leeches to the tender part.

*On examining this blood, urea was most distinctly detected in it, and in considerable quantity. The urine, at the same time, contained not a particle of urea, urates, uric acid, or albumen, and its specific gravity was only* 1·005.

I got him under the influence of mercury as quickly as possible. *As soon as its specific effect was apparent, urea gradually reappeared in the urine*, and its specific gravity increased. By degrees, the comatose symptoms subsided, and in the course of five weeks his usual health was re-established. He continues quite well.

The mode of detecting urea in the blood which I adopted, was the one recommended by Dr G. O. Rees (On the Analysis of Blood and Urine in Health and Disease, 2d Ed., page 40); and which I will

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describe shortly, as some readers may not have that useful work in their possession.

The first quantity of serum analyzed, was 400 grains by weight, which was evaporated to dryness over an open steam bath. I broke up the dry extract, added 2 oz. of distilled water, and digested it over a steam bath for an hour, occasionally supplying the loss of water; filtered the digested fluid; washing the residue on the filter with distilled water, which I added to the mother liquor. I then evaporated the whole over an open steam bath, and digested the residue with eight times its bulk of absolute alcohol at a gentle heat for half an hour; taking care not to diminish materially the bulk of the fluid. It was then filtered a second time; evaporated to dryness; and dissolved in a little lukewarm distilled water; and again evaporated to the consistence of a thin syrup. I now added a few drops of nitric acid, and set it aside to crystallize.

Previously to adding the nitric acid, a very strong odour of urea was perceived. On examining the fluid under the microscope to which the nitric acid had been added, tabular crystals of nitrate of urea were easily perceived, commencing in appearance as transverse lines across the watch-glass.

On examining, afterwards, a larger quantity of serum (600 grains), a more considerable quantity of the nitrate of urea was observed.

Although the quantities of serum analyzed, were, in both cases, small, undeniable proof of the existence in them of urea, in considerable quantity, presented themselves: there must then have been a large quantity of urea in the blood.

It was my intention to have ascertained the amount of urea in a certain portion of serum; but was obliged, from existing circumstances, to suspend my examinations at this point.

It is well known that in youth the quantity of urea in the urine is much larger than in the adult, owing to the more rapid disintegration of the tissues. In this case, a *considerable portion* of that excretion must have been circulating through the system.

In the absence of an actual examination of the organs affected, it appears to me, that the ramifications of the renal arteries, which form the external vascular portion of the kidneys, were ruptured by the accident, which would be followed by congestion and inflammation of the Malpighian bodies and Tubuli uriniferi; thus preventing all real secretion; and merely allowing the watery part of the blood to percolate through the tubular portion of the organs.